

WHAT IS CLAIMED IS:

1. A resistance system for an exercise machine comprising:
  - a plurality of resistance providing members having at least three different values of resistance; and
- 5 a selector for selecting sets of resistance providing members from the plurality of resistance providing members, the values of the resistances for a selected set determining the total resistance of the resistance system when the selected set is selected.
2. The resistance system as set forth in claim 1 wherein the resistance members have at least four different values of resistance.
- 10 3. The resistance system as set forth in claim 1 wherein one of the resistance providing members provides a predetermined minimum value of resistance, at least one of the resistance providing members provides a value of resistance at least twice the minimum value of resistance, and at least one of the resistance providing members provides a value of resistance at least four times the minimum value of resistance.
- 15 4. The resistance system as set forth in claim 1 wherein a majority of the resistance providing members provide values of resistance that are even multiples of a predetermined minimum value of resistance.
- 20 5. The resistance system as set forth in claim 1 wherein the resistance members are disposed horizontally such that the distribution of resistances about a central axis of the selector is substantially symmetrical.
6. The resistance system as set forth in claim 1 wherein the selector is a substantially flat plate disposed along one surface of the resistance providing members.
7. The resistance system as set forth in claim 6 wherein the selector includes actuators disposed to engage corresponding resistance providing members when the actuators

are actuated, the selected set of resistance providing members being selected by actuation of the actuators corresponding to the desired resistance providing members of the set.

8. The resistance system as set forth in claim 6 wherein the selector plate is disposed horizontally above the resistance providing members.

5 9. The resistance system as set forth in claim 1 wherein the resistance providing members are weights.

10. The resistance system as set forth in claim 1 wherein the resistance providing members are elastic cords.

11. The resistance system as set forth in claim 1 wherein the resistance providing 10 members are electromechanical.

12. The resistance system as set forth in claim 1 further including a controller automatically controlling the selector to change the total resistance of the resistance system upon occurrence of a predetermined condition, such as MMF.

13. The resistance system as set forth in claim 12 wherein the controller is 15 responsive to detection of the predetermined condition by a sensor associated with the exercise machine.

14. The resistance system as set forth in claim 12 wherein the selector is adapted to be controlled by a plurality of different controllers.

15. A resistance system for an exercise machine comprising:  
20 a plurality of resistance providing members disposed horizontally with respect to each other;

a selector adapted to select sets of resistance providing members from the plurality of resistance providing members, the values of the resistances for a selected set determining the total resistance of the resistance system when said selected set is selected; and

a controller automatically controlling the selector to change the total resistance of the resistance system upon occurrence of a predetermined condition, such as MMF.

16. The resistance system as set forth in claim 15 wherein the resistance members have at least four different values of resistance.

5 17. The resistance system as set forth in claim 15 wherein one of the resistance providing members provides a predetermined minimum value of resistance, at least one of the resistance providing members provides a value of resistance at least twice the minimum value of resistance, and at least one of the resistance providing members provides a value of resistance at least four times the minimum value of resistance.

10 18. The resistance system as set forth in claim 15 wherein the resistance members are disposed horizontally such that the distribution of resistances about a central axis of the selector is substantially symmetrical.

19. The resistance system as set forth in claim 15 wherein the selector is a substantially flat plate disposed along one surface of the resistance providing members.

15 20. The resistance system as set forth in claim 15 wherein the selector includes actuators disposed to engage corresponding resistance providing members when the actuators are actuated, the selected set of resistance providing members being selected by actuation of the actuators corresponding to the desired resistance providing members of the set.

21. The resistance system as set forth in claim 15 wherein the selector plate is disposed horizontally above the resistance providing members.

22. A resistance system for providing a controllable resistance for an exercise comprising:

a plurality of selectable weights, each of said plurality of weights being selectable to be included in the controllable resistance;

a selector disposed adjacent each of the selectable weights, said selector including a plurality of actuators corresponding to each selectable weight such that when one of the actuators is actuated the corresponding selectable weight is included in the controllable resistance.

5        23. The resistance system as set forth in claim 22 wherein one of the weights provides a predetermined minimum value of resistance, at least one of the weights provides a value of resistance at least twice the minimum value of resistance, and at least one of the weights provides a value of resistance at least four times the minimum value of resistance.

10       24. The resistance system as set forth in claim 22 wherein a majority of the weights provide values of resistance that are even multiples of a predetermined minimum value of resistance.

25. The resistance system as set forth in claim 22 wherein the weights are disposed horizontally such that the distribution of weights about a central axis of the selector is substantially symmetrical.

15       26. The resistance system as set forth in claim 22 wherein the selector is a substantially flat plate disposed along one surface of the weights.

27. The resistance system as set forth in claim 26 wherein the selector includes actuators disposed to engage corresponding weights when the actuators are actuated, the weights selected by actuation of the actuators corresponding to the desired weights.

20       28. The resistance system as set forth in claim 22 wherein the selector plate is disposed horizontally above the weights.

29. The resistance system as set forth in claim 22 further including a controller automatically controlling the selector to change the total resistance of the resistance system upon occurrence of a predetermined condition, such as MMF.

30. The resistance system as set forth in claim 29 wherein the controller is responsive to detection of the predetermined condition by a sensor associated with the exercise machine.

31. The resistance system as set forth in claim 29 wherein the selector is adapted 5 to be controlled by a plurality of different controllers.

32. An exercise machine comprising:  
a plurality of resistance providing members having at least three different values of resistance;

10 a selector for selecting sets of resistance providing members from the plurality of resistance providing members, the values of the resistances for a selected set determining the total resistance of the resistance system when the selected set is selected;

15 a manually operable member adapted to be moved by a user, said manually operable member being operatively linked to the selected set of resistance providing members so that movement of the manually operable member by the user must overcome the resistance provided by the selected set of resistance providing members.

33. The exercise machine as set forth in claim 32 wherein the manually operable member is operatively linked to the selected set of resistance providing members by the selector.

34. The exercise machine as set forth in claim 32 further including a controlling 20 for changing the selected set of resistance providing members to change the total resistance.

35. A method of retrofitting an exercise machine having a weight stack comprising the steps of:

removing the existing weight stack of the exercise machine;

replacing the existing weight stack with a set of weights having at least three different values of resistance;

providing a selector adapted to select various combinations of the weights in said set of weights.

5        36. The method as set forth in claim 35 further including providing a controller to automatically change the resistance provided by the set of weights in response to a predetermined condition.

37. A method of changing resistance in an exercise device comprising:

moving a selector to a predetermined position;

10        disengaging a first set of weights while the selector is at the predetermined position; engaging a second set of weights while the selector is at the predetermined position; said second set of weights including individual weights of at least three different values of resistance.

15        38. A resistance system for providing a controllable resistance for an exercise comprising:

a plurality of selectable weights, each of said plurality of weights being selectable to be included in the controllable resistance;

20        a selector disposed adjacent each of the selectable weights, said selector including a plurality of actuators corresponding to each selectable weight such that when one of the actuators is actuated the corresponding selectable weight is included in the controllable resistance; and

a base for receiving the weights, said base having a plurality of tapered openings for receiving the weights.

39. A set of weights for a piece of exercise equipment comprising;

- a first weight having a bottom, a top and sides, the sides having at least some taper toward the bottom of the first weight, the first weight having a predetermined mass;
- a second weight having a bottom, a top and sides, the sides having at least some taper toward the bottom of the second weight, the second weight having a mass approximately 5 twice the mass of the first weight; and
- a third weight having a bottom, a top and sides, the sides having at least some taper toward the bottom of the third weight, the third weight having a mass approximately four times the mass of the first weight.